



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Slommons, et al.
Appl No.: 10/005,633
Filed: December 5, 2001
For: MICROBEAM ASSEMBLY
FOR INTEGRATED CIRCUIT
INTERCONNECTION TO SUBSTRATES

Confirmation No.: 9245
Group Art Unit: 2827
Examiner: D. Graybill

Mail Stop Non-Fee Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO RESTRICTION REQUIREMENT

This is in response to the Office Action dated June 18, 2003, in which the Office Action requires an election of species. The Office Action listed two separate issues in the Restriction Requirement as outlined below:

- 1) The Office Action alleges that the claims recite different species of release layer material, namely polyimide and parylene, tungsten, oxide, glass, and oxidized metal. Further, the Office Action alleges that there is no generic claim covering these species.
- 2) The Office Action states that the claims recite different species, namely solder, gold, and aluminum, for the bump connected to the electrodes of the device.

With regards to the Restriction Requirement, Applicants provisionally elect with traverse to prosecute Claims 25-28, 31, 32, 36, 39, and 42-48. This election includes claims directed to a release layer being made of polyimide or parylene and the bump being formed of solder.

With regard to this election, Applicants respectfully submit that independent Claim 25 is generic with regard to release layers formed from polyimide and parylene, oxide, and glass. Specifically, independent Claim 25 recites an "etchable release layer," and all of these materials are etchable. This is reflected in the fact that Applicants have submitted dependent claims depending from independent Claim 25 for each of these etchable release layer materials, (e.g., polyimide or parylene (Claim 26), oxide (Claim 37), and glass (Claim 38)). As such, if independent Claim 25 is

found patentable without the addition of recitations to a specific species, then non-elected Claims 37 and 38 should also be found allowable.

Further, independent Claim 43 is generic to all of the types of release layers, as it merely recites "a release layer located on a second region of said carrier." This is reflected in the fact that Applicants have submitted dependent claims depending from independent Claim 43 for each release layer material, (e.g., polyimide or parylene (Claim 48), tungsten (Claim 49), oxidized metal (Claim 50), oxide (Claim 51), and glass (Claim 52)). As such, if independent Claim 25 is found allowable without the addition of recitations to a specific species, then non-elected Claims 49-52 should also be found allowable.

Applicants further submit that independent Claim 25 is generic to the different types of bump material: solder, gold, and aluminum. On page 3, the Office Action states that "claim 5 is generic to the species wherein the bump is solder, gold, and aluminum." Applicants assume that this is a typo as Claim 5 is currently cancelled, and that the Office Action instead was referring to Claim 25. Applicants respectfully submit that if independent Claim 25 is found allowable without the addition of recitations to a specific species, then non-elected Claims 34 (gold) and 35 (aluminum) should also be found allowable.

Due to previous amendments and cancellation of claims, Applicants note that it may be somewhat confusing to keep up with the various claims of the application. In light of this concern, Applicants have enclosed herewith a set of claims as they currently stand in the application. Applicants hope that this aids the Examiner's review of the claims.

Should the Examiner have further questions or comments with respect to examination of this case, it is respectfully requested that the Examiner telephone the undersigned so that further examination of this application can be expedited.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those, which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required

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therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

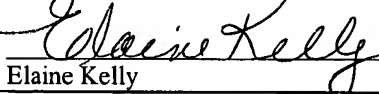


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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Non-Fee Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on July 14, 2003


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CLT01/4600852v1

Below is a listing of the claims as they currently stand in the application. The claims have not been amended. They are merely being provided herein as a courtesy to the Examiner for use in his examination.

Claims 1-24 are cancelled.

25. A microbeam assembly adapted to form interconnects between integrated circuit bond pads and substrate contacts, the microbeam assembly comprising:

a carrier;

a release layer located on said carrier, said release layer being etchable; and

a plurality of conductive microbeams releasably bonded to said release layer, wherein the conductive microbeams are sized and spaced to mate with the bond pads of an integrated circuit, and wherein said microbeams are releasable from said carrier by at least partially etching away said release layer.

26. A microbeam assembly according to Claim 25 wherein the carrier is a tape automated bonding (TAB) carrier and said release layer is formed from a material selected from the group consisting of polyimide and parylene.

27. A microbeam assembly according to Claim 25, wherein the carrier is substantially rigid.

28. A microbeam assembly according to Claim 25, wherein the carrier comprises fan-out conductors for electrical testing of an integrated circuit.

29. (Cancelled).

30. (Cancelled).

31. A microbeam assembly according to Claim 25 wherein at least one microbeam comprises a bump.

32. A microbeam assembly according to Claim 31 wherein the bump is comprised of solder.

33. (Cancelled).

34. A microbeam assembly according to Claim 31 wherein the bump is comprised of gold.
35. A microbeam assembly according to Claim 31 wherein the bump is comprised of aluminum.
36. A microbeam assembly according to Claim 32 wherein the at least one microbeam further comprises a solder dam.
37. A microbeam assembly according to Claim 25, wherein the release layer comprises an oxide.
38. A microbeam assembly according to Claim 25, wherein the release layer comprises glass.
39. A microbeam assembly according to Claim 28, wherein said fan-out conductors are located on a first region of said carrier and said release layer is located on a second regions of said carrier, wherein said conductive microbeams are releasably bonded to said release layer and are in electrical communication with said fan-out conductors for electrical testing of an integrated circuit connected to the microbeams.
40. A microbeam assembly adapted to form interconnects between integrated circuit bond pads and substrate contacts, the microbeam assembly comprising:
a carrier;
a release layer located on said carrier, said release layer comprising an oxidized metal; and
a plurality of conductive microbeams releasably bonded to said release layer, wherein the conductive microbeams are sized and spaced to mate with the bond pads of an integrated circuit.
41. A microbeam assembly adapted to form interconnects between integrated circuit bond pads and substrate contacts, the microbeam assembly comprising:
a carrier;
a release layer located on said carrier, said release layer comprising an oxide; and
a plurality of conductive microbeams releasably bonded to said release layer, wherein the conductive microbeams are sized and spaced to mate with the bond pads of an integrated circuit.

42. A microbeam assembly adapted to form interconnects between integrated circuit bond pads and substrate contacts, the microbeam assembly comprising:

a carrier;

a release layer located on said carrier, said release layer comprising glass; and

a plurality of conductive microbeams releasably bonded to said release layer, wherein the conductive microbeams are sized and spaced to mate with the bond pads of an integrated circuit.

43. A microbeam assembly adapted to form interconnects between integrated circuit bond pads and substrate contacts, the microbeam assembly comprising:

a carrier;

a plurality of fan-out conductors located on a first region of said carrier;

a release layer located on a second region of said carrier;

a plurality of conductive microbeams located on said release layer, wherein each of said conductor microbeams is in electrical communication with at least one of said fan-out conductors.

44. A microbeam assembly according to Claim 43, wherein said fan-out connectors are located on a first region of said carrier and said release layer is located on a second region of said carrier and at least partially surrounds said fan-out connectors.

45. A microbeam assembly according to Claim 43, wherein at least one of said conductive microbeams is located on said release layer and extends at least partially onto one of said fan-out conductors.

46. A microbeam assembly according to Claim 43, wherein at least one of said fan-out conductors is adjacent to said release layer and at least one of said conductive microbeams is located on said release layer and extends at least partially onto one of said fan-out conductors.

47. A microbeam assembly according to Claim 43, wherein said release layer is etchable and said microbeams being releasable from said carrier by at least partially etching away said release layer.

48. A microbeam assembly according to Claim 43 wherein the carrier is a tape automated bonding (TAB) carrier and said release is formed from a material selected from the group consisting of polyimide and parylene.

49. A microbeam assembly according to Claim 43, wherein the release layer comprises tungsten.

50. A microbeam assembly according to Claim 43, wherein the release layer comprises an oxidized metal.

51. A microbeam assembly according to Claim 43, wherein the release layer comprises an oxide.

52. A microbeam assembly according to Claim 43, wherein the release layer comprises glass.